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## ABSTRACT

Although the nation's two-year college movement has been largely successful in providing higher education to a broad range of people, new barriers are emerging to the performance of this function. The problem is evident in the fact that increasing numbers of students neither enter nor leave the educational system with the competencies necessary for effective performance as workers, students, family members, and citizens. The solution lies with integration of content and general instruction, and stressing thinking skills across the curriculum. The process of thinking combines those conscious and unconscious mental tools and strategies used when reacting to a choice. Teaching thinking will not interfere with the amount of course content which needs to be taught, it will simply redefine and restructure the delivery of a two-year education. Rather than memorizing or ignoring complex problems, students trained in critical thinking would reflect, explore, examine, discuss, and defend their insights and mental processes. Students with the ability to think will meet the growing demand for competent communicators, thinkers and learners. (VVC)

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THE EXAMPLE OF TEACHING THINKING

Southern Association of Community, Junior, and Technical Colleges

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by

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# Disciplinary Versus General Competence: Coming Curricular Revolution?

## The Example of Teaching Thinking

by Curtis Miles

Bricks and mortar, catalogs, curricular sequences, FTE reports, and graduation lists suggest that two-year colleges have carried out the most successful revolution in American education in this century. They have offered quality higher education to most American citizens, not through tinkering with traditional ways but through providing a fundamental alternative to the traditional higher education delivery system.

Revolutions, however, are transitory. We now confront some even tougher barriers to making American higher education a truly effective servant of our society and economy: barriers arising less from institutional types than from how we organize and deliver instruction in the United States.

The problem is evident as we pursue many of our newer or persisting missions: working more closely with business/industry and with public schools; educating growing populations of immigrants; combatting workforce illiteracy; responding to the persistent need for developmental education; and wrestling with the social, institutional, and economic consequences of falling enrollments among black males.

In each area, there is a sense that too many students neither enter nor leave the educational system with the full array of competencies needed for effective performance as workers, students, family

members, and citizens. The three R's, abilities at thinking, learning, and relating to others, and more importantly the *inclination* to master and use such abilities seem problematic for many. General competencies appear to be scarce.

### Competence for What?

Evidence of the need lies no farther than the *AACJC Journal*. Carnevale (1989, F/M: 29) concludes from a two-year study of American business and industry that "employers want a new kind of worker with a much broader set of skills — or at least a strong foundation of basics that will enable them to learn on the job. They seek employees skilled in problem-solving, listening, negotiating, and knowing how to learn. Without these essential skills, the work force, including entry-level, dislocated, and experienced workers, will have difficulty adapting to economic and technological changes." Studies as far back as Lusterman's (1977) consistently conclude that the educational enterprise, including two-year colleges, does not routinely develop such skills.

As in the 1950's and 1960's, there is an uneasy sense of discontinuity between the American educational system and the needs of the broader society and economy. This time, however, two-year colleges start out as part of the problem rather than a response to it.

Fundamental changes in the system, if they come, will focus on redefining not who can come to higher education but what they find there. The entrenched interests will represent not traditional institutions so much as traditional beliefs about how education should be organized and delivered.

How can two-year colleges reasonably be expected to respond to the crescendo of demands for people who are competent communicators, thinkers, and learners as well as content specialists? We face the triple constraints of input (too many students with weak skills and often weaker motivation), processes (a two-year time frame and expanding content requirements, matched against students who are often full-time parents and/or workers), and outcomes (people prepared to perform effectively in later colleges and universities or in complex careers).

The answer lies not in more education: the basket cannot expand, and little more can be packed in. It lies not in more skilled education: two-year colleges already attract an exceptionally high percentage of excellent, student-oriented faculty. We also cannot weaken the disciplinary side of a two-year education: anatomy for nurses, history and literature for AA/AS students, COBOL and RPG for computer students, or counseling techniques for human services graduates. What to do?

## Combining Content and General Competencies

The solution lies in the idea of *different* education: the opportunity to reconfigure traditional content-oriented approaches to curriculum and pedagogy. Having survived two revolutions in our curricula and pedagogy in the past two centuries, American higher education may be set for a third, with two-year colleges perhaps playing a critical role.

By the year 2000, some segment of the system will routinely produce students possessing sound content backgrounds plus the ability to think, learn, speak, deal with others and in general behave in an educated and professional manner. Most likely, this segment will be business/industry itself, two-year colleges, or some emerging third party.

Two-year colleges have mostly accepted the posture of "senior" institutions that a sound discipline-based education will produce these more general competencies along with competence in the particular discipline. Unfortunately, there is no solid evidence that this is the case at either two-year or four-year institutions. In fact, there is growing evidence from business and industry, students, other colleges, and our own faculty that this transformation does not routinely occur for many.

Is it possible to reconfigure the flow of our curricula and pedagogy so that both disciplinary and general competence can be attained within two years? It is no less possible — though perhaps less easy — than breaking the barriers to access to higher education in the 1950's and 1960's.

The major logjam is perceptual rather than institutional: the assumption that teaching general competencies represents an addition to disciplinary instruction. There exists a false assumption that more emphasis on general competencies will inevitably mean less technical competence or less preparedness for further education.

There is a double irony here. First, isolated courses in thinking, learning, speaking, etc. will have limited impact, just as isolated courses in writing have proven of limited effectiveness in improving long-term writing behavior. For impact, such instruction must be integrated with rather than replace disciplinary instruction.

Secondly and most ironically, research and practical experiments suggest that a deliberate emphasis on general compe-

tencies can result in substantially greater content learning. A student who, for example, becomes skilled at learning strategies or problem-solving techniques will tend to apply those competencies to his or her disciplinary content.

## The Example of "Teaching Thinking"

The remainder of this report focuses on one example of the challenge presented by integrating general and content instruction in two-year college curricula: the possibility of teaching students to think.

A decade ago most educators viewed "thinking" as a relatively fixed trait: something only marginally altered by instruction, and even then only deliverable by specialists. Today, growing numbers of curriculum developers, writers, researchers, trainers, and individual faculty are firmly convinced that thinking can, in fact, be taught. And, moreover, that it can be taught successfully by ordinary teachers in ordinary classrooms.

There is little doubt that we can develop in students a more conscious, more skilled, and more active use of their minds. There is also little doubt that this pays off in terms of heightened student learning, problem-solving ability, and self-confidence as well as content learning.

Evidence abounds of broad enthusiasm for "teaching thinking." Growing numbers of states, led by bellwether New Jersey, are mandating thinking as an educational outcome. The Association for Supervision and Curriculum Development has devoted five issues of its journal, a newsletter, a national network, and dozens of training seminars to the issue of thinking skills. Thinking skills appears on the programs of almost all educational associations (including AACJC, as far back as a decade ago). Major grant funds, research agendas, and professional and student publications multiply.

## What Do We Mean By "Thinking"?

"Thinking" employs many aliases: critical thinking, creative thinking, problem-solving, metacognition, learning strategies, decision-making, and so forth. Beyer (1987: 32) observes the most common designation and concludes that "the term 'critical thinking' is one of the most abused terms in our thinking skills vocabulary. Generally, it means whatever its users stipulate it to mean." One way to clarify some of the confusion is to view thinking from two perspectives: from its purposes and from its processes.

**The purposes of thinking:** Many definitions and theories approach thinking in terms of what it seeks to accomplish. Is the purpose to establish the validity of an argument or conclusion? These are the *critical thinkers* emerging largely from a philosophy tradition. Is the purpose to *solve problems*? This group views thinking largely from the viewpoint of science, mathematics, engineering, and similar disciplines. Is the purpose *learning*? Expect to find many of these advocates emerging from psychology and study skills. Each such group tends to define the act something like this: "thinking is the use of cognitive processes to ... [reach conclusions, solve problems, etc.]" The emphasis is on the end product.

**The processes of thinking:** An alternative perspective, arising from a potpourri of psychologists, teachers, and others, views thinking as a sort of "mental toolkit" of skills, strategies, and dispositions available to each person no matter what the purpose. Like a medical doctor or auto mechanic, a thinker has a kit of generalized and specialized tools for plying his or her trade. The art and science then lie in extracting and effectively using the right combination of mental tools when faced with a particular choice (judgment, problem, decision, learning opportunity, etc.).

For example, a basic mental tool would be to "explore alternatives". Using this tool could mean exploring alternative interpretations or evidence (*critical thinking*), brainstorming (*creative thinking*), or analyzing alternative solutions (*problem-solving*). The same tool will have different applications for different purposes and the process rather than the product will be the definitional focus. Advocates of such views will tend to define thinking something like this: "Thinking comprises those conscious and unconscious mental tools and strategies we use when reacting to a choice."

## Teaching Thinking Across The Curriculum

This "process" view of thinking seems more flexible and functional, particularly if we are concerned with an approach which can be integrated with content instruction across the campus. The "purpose" orientation tends to lead to sound but isolated disciplinary approaches. The "process" orientation makes it possible to imagine a faculty and curriculum with a common understanding of a set of basic cognitive tools, of the strategies and motivations needed to use them effectively, and of the basic instructional techniques and assignments

which would develop such capabilities.

In such a situation, students would receive persistent and reasonably consistent development of their thinking competence each day, in every course. The content of each problem, decision, or analysis would be the course content. "Thinking" would naturally take on different flavors across engineering, liberal arts, and business programs. Yet students would encounter familiar approaches in each course while the burden of "teaching thinking" would be spread so widely that it might interfere little with "covering the material" in a particular course.

Would such an approach be feasible? Some colleges are committing the entire college faculty to "teaching thinking." Others are committing a division or department to this goal. Still others are requiring a thinking skills course of all students: a first step towards the type of integration which seems needed.

Yet massive difficulties loom: economic, political, human, legal, bureaucratic, and pedagogical difficulties. A particularly thorny problem will be the conviction of some faculty that giving them direct responsibility and accountability for "teaching thinking" in an explicit way will make their jobs harder rather than easier.

### **Making Faculty Life Easier and/or More Rewarding**

Faculty are already pressed hard to cover their disciplinary content in what often seems to be a steadily shrinking period of time. Weak student skills collide nastily with explosions in information and technology. If "teaching thinking" is seen as a new content area, then clearly it will only magnify the problem.

In reality, "teaching thinking" in the ways summarized above is far less a new content area than a new way of structuring and delivering a two-year college education.

Faculty could teach far more effectively and rapidly if blessed with classes filled with students who were active learners, good problem solvers, motivated, able to understand rather than simply memorize, and in general skilled and conscious users of their own minds. Teaching thinking is designed to encourage development of exactly that kind of student.

The results? Perhaps a substantial diminishment of the standard litany of faculty complaints about students. Following are some examples of how the

deliberate teaching of thinking processes can diminish such concerns, making faculty life easier and/or more rewarding.

*"Students Only Memorize."* Clearly, memorization is the learning habit of choice for far too many of our students. However, the reality is that many of them, and not just weak students, do not know that there is another way to learn. The literature on the differences between good and poor students underscores that good students tend to manipulate incoming information in many ways, while poor students have few such tools for learning. Not knowing that there are other processing tools within reach, how can we expect them to magically change after twelve or more years of success with memorizing?

A major strand of the literature on thoughtful learning focuses on "information processing." This is simply the idea that meaningful learning occurs in a three-phase cycle: input (extracting meaningful information from the torrent of data which surrounds us), processing (manipulating this information so that it finds a place within the structure of what we already know), and output (calling up the information when we need to use it to solve problems, think things through, analyze something, etc.).

Does this sound like a mental toolkit applied to learning? It is. There are specific tools useful when we process new information, such as "look for relationships" with what we already know and "visualize" the information in action. Once a student realizes that this is how he/she does in fact learn, the thinking toolkit becomes potent. As but one example, a student could become skilled at using the tool of "visualizing" either to process knowledge (mentally walk through a newly-taught procedure) or to recall it (visualize the notebook page, or where the teacher was standing when she said it).

A student consciously equipped with, and ready to use, the thinking tools related to information processing is likely to be a much more able learner, far beyond memorization.

*"Students Can't/Won't Solve Problems."* Again, the literature underscores the degree to which students do not solve problems because they don't know how. Weak students, given a flexible process for dealing with a certain type of problem, simply memorize the process. Most reasonably-complicated problems involve several steps before reaching a solution, yet many students persistently

demonstrate that they can only solve a problem if there is a single step. If they cannot come up with the full process for solving at the outset, they do not know what to do other than go inert. Their problem-solving skills are weak, and their confidence weaker.

Good problem-solvers, on the other hand, use an array of thinking tools, in varying combinations depending on the situation, tools such as: start with the simplest thing, identify the goal, examine alternatives, take it one step at a time, work backwards, clarify what you know, and many others. Such tools are teachable. The strategies for deciding when and how to use them in a particular situation are teachable. Students who have and use such a toolkit on a daily basis in ordinary classrooms soon transcend their former performance as one-shot problem-solvers who are easily frustrated.

*"Students Don't Think."* This usually means that students do stupid things. Having laboriously cranked in the formula, they never ask themselves if the answer could possibly be right. They blithely ignore the instructions while launching off in wild directions. They seem to have little awareness of what they know, and don't know. They do not, in short, seem to be in touch with their minds or with what they are doing.

One solution? Another set of thinking tools, under the umbrella of "metacognition". Metacognition is merely a set of processes to use in consciously managing our mental processes and status. The processes might be considered a three-stage spiral: awareness (of our ideas, what we're doing, whether we're concentrating, if we're lost, etc.), assessment (is that status appropriate or not?), and management (if it isn't appropriate, then what actions should we take to get back on track?).

We constantly use metacognition to manage our minds' activities. There are discrete mental processes associated with this aspect of thinking, which can be taught to students. Once equipped with such tools, they are far more likely to attend to academic details such as directions, the plausibility of answers, and the state of their own ignorance.

*"Students Lack Motivation."* Most students are not at two-year colleges because of an innate love of ideas. Learning, for them, will not be inherently motivating. Some will be motivated by clear long-term goals, such as careers, while self-pride or competitiveness will

motivate others. The rest? Lacking other incentives, they will lapse into the disinclination to study, do homework, and go beyond the minimum.

Teaching students to think will not by itself cure the problem of lack of motivation, though it will help. However, the changes in classroom dynamics and expectations which accompany teaching thinking can bring about such a result for a surprisingly large number of students. Teaching thinking is implicitly an active endeavor. Students must be involved; they must reflect, explore, discuss, share, and defend their insights. There is no one "right" set of tools for solving a problem; each student may legitimately forge his or her own path according to individual learning and cognitive styles. "Right answers" will still be sought, but different paths must be respected.

The results of such a different set of dynamics? Active learning. The type of involvement in learning demanded by adult learners. A sense of accomplishment through personal growth. The classroom characteristics which study after study have deemed crucial in enhancing motivation to learn.

Such possibilities paint an appealing picture. Thinking can be taught, and if we believe what we hear from our economy and society it must be taught with far greater consistency and growing urgency. The thinking tools approach seems to offer hope of being practical on a persistent institution-wide basis. Equipping students with such skills would seem to pay major dividends to faculty in terms of teaching effectiveness without substantially undercutting their ability to cover their disciplinary content.

Is it feasible to hope to effectively teach thinking and other general competencies in addition to disciplinary content? Or is the idea a pipe dream? No one sensitive to the difficulties of changing institutions and individuals will understate the difficulty. But the possibility is probably no more unrealistic and no less important than was the idea three decades ago of creating a whole new class of colleges to serve all Americans.

Among the flood of publications relating to issues of general competence are the following.

Carnevale, Anthony P. et al. "Workplace Basics", **Community, Technical, and Junior College Journal**, February/March, 1989.

Costa, Arthur (ed.). **Developing Minds**. Washington, D.C.: Association for Supervision and Curriculum Development, 1985.

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Lusterman, Seymour. **Education in Industry**. New York, N.Y.: The Conference Board, Inc., 1977.

McKeachie, Wilbert et al (Eds). **Teaching and Learning in the College Classroom**. Ann Arbor: University of Michigan Press, 1987.

Miles, Curtis. "The Fourth R: Reasoning." Quarterly column in the **Journal of Developmental Education**., 1978-present.

Richardson, Richard et al. **Literacy in the Open Access College**. San Francisco, Jossey-Bass, 1983.

Wlodkowski, R.J. **Enhancing Adult Motivation to Learn**. San Francisco: Jossey-Bass, 1985.

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